NOTES
UPON BOTH
GLOBES
CELESTIAL
And
TERRESTIAL.

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NOTES UPON BOTH GLOBES Celestial and Terrestial.

First Concerning the Celestial GLOBE.

IT is the model of Heaven, but chiefly of the Eight Sphere, wherein three things are to be observed in general, *viz.*

1. Definition.
2. Delineations.
3. Use.

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1. *The Definition.*

It is a Spherical body, having a point or center in the midst, from whence right lines being extended to the superficies they are all equal.

2. Delineations.

Which are theſe Three.

1. *The Lines or Circles.*
2. *The principle Points.*
3. *The Figures or Conſtellations.*

FIrſt of the Lines or Circles, every of which are actually or intellectually divided into 360 equal parts, called Degrees, the more principle whereof are theſe Ten, which make up the *Sphæra armillaris*, ſix whereof are great Circles, as be all thoſe which divide the Globe into two equal parts, or Hemiſpheres, having the ſame Center with the Globe; And the other Four are called Smaller Circles, becauſe they divide the Globe into two unequal parts or Segments.

The Six great Circles are theſe.

1. The Horizon is a broad Circle upon the frame, this divideth the Globe into two Hemiſpheres, the one which we ſee, is always above the Horizon, the other which we ſee not, is below: And on the Horizon are drawn divers Circles, *viz.* of the 12 Signes and of the days of the Months, and the 32 Winds.

2. The Meridian is the Braſs Circle which ſtandeth at right Angles to the Horizon, and in which

which the Globe is hanged and turned about on its Poles, which are the ends or extremities of the Axis of the World, and upon the Meridian, is another little hour Circle fastened, with an index moving about upon the Pole.

3. The Equinoctial is drawn upon the Superficies of the Globe, in the midst between the two Poles of the World, and the degrees thereof are numbred with 10, 20, 30. &c. to 360.

4. The Ecliptick line, this cutteth the Equinoctial in two points, and is divided into 12. Signes, each containing 30 degrees, and it passeth in the midst of the Zodiack, for the Zodiack is a broad circle containing 16. degrees in breadth, and is the bounder of the 7 Planets.

5. The Equinoctial Colure, this cutteth the Equinoctial at right Angles, in the two points where the Ecliptick passeth over the same Equinoctial Line, and so passeth through the Poles of the World.

6. The Solstitial Colure, this passeth through the Ecliptick where it toucheth both the Tropicks, and cutteth both the Equinoctial and Ecliptick at right Angles, and passeth through the Poles of the World, where also it cutteth the Equinoctial Colure at right Angles.

The Four lesser Circles are,

1. The Two Tropicks, each being parallel to the Equinoctial, and about 23 degrees and 31 m.

from it. That which is toward the *North* Pole, is called the Tropick of Cancer; That which is towards the *South* Pole, is called the Tropick of Capricorne, and theſe are the bounders of the greateſt Declination of the Sun.

2. The Two Polar Circles, Theſe are ſo far diſtant from the Poles of the World, as the Tropicks are from the Equinoctial; That which is next to the *North* Pole, is called the Artick Polar Circle, and that which is next the *South* Pole, is called the Antartick Polar Circle.

There are moreover drawn upon this Globe divers other great Circles paſſing by the beginning of the Twelve Signes, cutting each other in Two oppoſite points, and theſe with the Solſtitial Colure, divide the Globe into 12 equal parts, and theſe are called the Circles of the Longitude of Stars.

Alſo through every point of the Meridian, there are ſmall Circles imagined to be drawn parrallel to the Equinoctial, which are called the parallels of Declination of the Sun and Stars.

Alſo the like ſmall Circles are imagined to be drawn parallel to the Horizon, and theſe are called Almicantars, or Circles of Latitude.

The Second thing noted in the Delineation is the Points to be obſerved in the Globe.

1. THE more principal are theſe, *viz.* The Two points on which the Globe is hanged

ged and turned about within the Brazen Meridian, these represent the Poles of the World, from one of which to the other, there passeth a streight Line through the Center of the Globe called the Axis of the World: Where Note, that the Two Poles of the world, are the common Sections of all the Meridian Circles.

2. The Two Poles of the Ecliptick, which are the two points in which the Six Circles of Longitude of Stars do cross or cut each other, and is near about 23 Degrees 30 Minutes distant from the Poles of the World.

3. The Points of Zenith and Nadir, the Zenith is that Point in the Heavens which is directly over our Head, and the Nadir, is the contrary, directly under our Feet, these Two are the Poles of the Horizon, being every where 90 Degrees from it, and in these Two Points do all the Vertical or Azimuthal Circles meet or cut each other.

4. The Points of *East* and *West*, *viz.* The two points where the Equinoctial cutteth the Horizon; these are also Diametrically opposite, and are the Poles of the Meridian being every where 90 Degrees from it.

5. The Two Equinoctial Points of Aries and Libra, being two points where the Ecliptick cutteth the Equinoctial, and are Diametrically opposite, the former is called the Vernal Equinoctial, because the Sun coming to it, the

Spring

Spring beginneth; the other is called the Autumnal Equinoctial, because when the Sun cometh to it; the Autumn beginneth.

6. The Two Solstitial points, being also Diametrically opposit, are the two points on the Globe where the Ecliptick toucheth the Two Tropicks and the Ecliptick in their touch point, *viz.* in the beginning of Cancer and Capricorn, and these Two are called Solstitial points, because the Sun moving in the Ecliptick, near either of them, which is in *June* and *December*, it causeth the days to stand still a while, without a sensible lengthning or shortning.

Here is to be noted, that the Horizon and Meridian Circles are said to be immoveable, because they are fixed to the same place; but all other Circles of the Sphear are said to be moveable, because they being drawn upon the Surface of the Globe or Sphere, must needs move about it in the Diurnal motion, yet other Men denominate them by the contrary names.

The Third thing Observed in the Delineations, are the Figures drawn upon the Globe.

THere have been 48 Asterismes or Constellations observed of ancient time, and about them in this Globe are described certain Figures, not because there are any such Figures

gures in the Heavens, but are only imagined there to give denomination to the Stars of the Firmament, and yet not to all the Stars, for they are innumerable, but only to ſuch as are moſt conſpicuous, and whereof uſe may beſt be made, as occaſion ſerveth.

There are 12 Conſtellations of the Zodiack, through which the Zodiack paſſeth, and theſe give Denomination to the 12 Signes of the Zodiack, in particular theſe with their number of Stars.

	of old.	of late.		of old.	of late.
♈	13	21	♎	8	17
♉	33	43	♏	21	16
♊	18	25	♐	32	14
♋	9	15	♑	28	28
♌	27	40	♒	42	41
♍	26	39	♓	34	36

There have been 21 Conſtellations obſerv'd on the *North*-ſide of the Ecliptick, which are called the Northern Conſtellations, whoſe names and number of Stars here follow.

	of old.
The little Bear	7
The great Bear	27
The Dragon	31
Cepheus	11
Bootes	22
The Northern Crown	8

Hercu-

Hercules	9
The Vulture Cadent	10
The Swan	17
Caſſiopeia	13
Perſeus	26
Aurige	14
Serpentarius	24
The Serpent	18
The Arrow or Dart	5
The Eagle	6
The Dolphin	10
The leſſer Horſe	4
Pegaſus, or great Horſe	20
Andromeda	23
The Northern Triangle	4.

There are 15 Conſtellations on the *South*-ſide of the Ecliptick, which are called the Southern Conſtellations, whoſe names and number of Stars here follow.

	of old.
The Whale	22
Orion	38
The River Eridanus	34
The Hare	12
The great Dog	18
The leſſer Dog	3
The Ship	45
The Goblet	7

The Raven	7
The Centaur	37
The Wolf	19
The Alter	7
The Southern Crown	13
The South-fiſh	12

Beſides the number of the Stars noted in the former Conſtellations, the Modern Aſtronomers have noted divers others, which were left *in formes* by the Ancients, and put them into their proper Figures; as may be ſeen in ſome of the Globes put forth ſince Noble *Ticho Brahe*, namely, *Johannes Janſonius*, his ſmall Globes of the Year 1620. And in *Petrus Plantinus* his Globes of the Year 1625.

The New Conſtellations in North Latitude, are theſe;

Berenices hair	14
The Bee	4
The River Jordan	21
Camelopardalis	18
The River Euphrates	13

The New Conſtellations in South Latitude, are theſe;

The leſſer Crabb	4
The Unicorne	22

Moreover becauſe the Ancient Aſtronomers lived all in North Latitude, they could not ſee the Stars which are near the South Pole, but they have been ſince diſcovered by ſuch as have travailed that way, and are put into conſtellations, namely theſe,

The Dove	11
The Southern Triangle	5
The *apous Indica*	12
The Peacock	17
The Indian	12
The Crane	13
The Towcan	8
The Hydrus	14
The Phenix	14
The Dorado	6
The Sea Swallow	7
The Camelion	8
The Croſs call'd *Cruſero*	6
The Flye	4

Beſides the Conſtellations before named, there are ſome other appearances in the Heavens, namely, the White broad Circle, called *Via Lactea*, or Milkie way: and two little clouds obſerved near the South Pole. Thus much of the Delineation, or things noted on the outſide of the Celeſtial Globe.

The

The Third thing to be observed in General is the use of this Globe.

Which consisteth in these three things following, viz. The knowledge of the

1. *Motions.*
2. *Division.*

And Operation on the

3. *Propositions.*

In the first place of Motions, which are Two in number, *viz.*

1. The *Diurnal* Motion.
2. The *Proper* Motion.

First concerning Motions.

1. The *Diurnal* motion is made upon the Poles of the World, once about from East toward the West in 24 hours, and this is also called *motus rapt us*, or the motion of the *primum mobile.*

2. The Second motion is called the *annual motion*, and is made within the *primum mobile* upon the Poles of the Ecliptick, according to the succession of the Signes, which is contrary to that of the *primum mobile*, *viz.* from West to-

towards East. and this motion is called *Notus secundus*, or *Motus proprius*, because that every Sphere hath a motion proper to it self, As that of the Sun ☉ finisheth once about *secundum seriem signorum* in the space of twelve months, which is called the Solar Year, also *Venus* ♀, and *Mercurie* ☿, are moved about the same way in the same time, but the *Moon* ☾ is moved about in one month, and the month is of two sorts, for the time wherein the Moon ☾, departeth from any point of the Zodiack and returneth to it again, is called the Periodical Month, or Month of peragration: But the time wherein the Moon departeth from the Sun ☉, and overtaketh him again, is called the Month of Consecration, or Synodical Month.

Mars ♂ moveth through the Zodiack in about two Solar years, and that time is called the year of Mars ♂.

Jupiter ♃ is moved through the Zodiack in about 12 Solar years, and that time is called the year of Jupiter ♃.

Saturn ♄ in about 30 years runneth through the Zodiack, and that time is called the year of *Saturn* ♄.

3. The fixed Stars, according to *Ptolomie* move about the Zodiack in 36000 Solar years, But according to the *Alphonsines* in 49000 years, and according to *Copernicus* in 17000 years;

years; But *Gaſſendus* hath it 25000 Years; And this time is called the great Year, or *Platonical* Year.

Secondly concerning the Diviſions.

1. Firſt it is called *Sphera recta*, or a right Sphere, becauſe in ſuch poſition, the Equinoctial cutteth the Horizon at right ſpherical Angles. The properties of the Sphere is to have the Poles of the World ly in the Horizon, and the Equinoctial paſſeth through the Zenith and Nadir; and in this Sphere not only the Equinoctial, but alſo both the Tropicks, and all other the Equinoctial parallels, are divided into two equal parts by the right Horizon, which cauſeth the days, and nights, at all times of the year to be equal, *viz.* 12 hours long between Sun riſing and ſetting without alteration, to thoſe who live under the Equinoctial line.

2. Secondly it is called *Sphæra Obliqua*, whereof there be ſo many in number as there be degrees, minutes, ſeconds, *&c.* in a Quadrant, And it is called oblique, becauſe the Equinoctial cutteth the Horizon with an oblique Angle; The properties of this ſphere is to have one Pole elevated above the Horizon, and the other as far depreſſed: Alſo becauſe in this ſphere the Equinoctial is divided equally by the

the Horizon, and the parallels of the Equinoctial unequally, therefore the days, and the nights are equal only twice a year, *viz.* in the beginning of the Spring, and Autumn, at which times the Sun passeth over the first point of Aries ♈ and Libra ♎, but all other times of the Year, the days and nights are unequal.

3. It is called *Sphera parallela* or a parallel Sphere, because the Equinoctial being the same with the Horizon, all the parallels of the Equinoctial are also parallels to the Horizon; In this Sphere, one of the Poles of the World is the Zenith, and the other is the Nadir, and in this Sphere the Sun continueth above the Horizon about half a year together, and again as long under the Horizon, whereby the artificial day and night are each about half a year long.

Thirdly, now follow the propositions wrought by the Globs.

1. To find the Suns place in the Ecliptick; first find the day of the Month, upon the Horizon, and within upon the limb of the Horizon standeth the degree in which the Sun is, this you may apply to the Ecliptick upon the Globe.

To find the Suns Declination.

2. First find the Suns place in the Ecliptick upon the Globe, and bring it to the brazen Meridian

ridian, and there account how many degrees it is distant from the Equinoctial, for the declination of any point in the heavens is its Meridional distance from the Equator.

The declination of any Star upon the Globe, is found by bringing it to the brazen Meridian and accounting as before.

To find the right Ascention of the Sun.

3. Move the degree of the Ecliptick wherein the Sun is to the Meridian, and note the degree of the Equinoctial which cometh to the Meridian with it, for the Arch of the Equinoctial contained between that point and the first point of Aries ♈, is the right ascention, that is to say, it riseth with it in a right Sphere.

The right ascention of a Star is to be accounted as before, if the Star be brought to the Meridian.

Of the Longitude as it is taken on the Celestial Globe.

4. The Longitude of the Sun, is that Arch of the Ecliptick which is contained between the first point of Aries, and that point of the Ecliptick wherein the Sun ☉ is; But the Longitude of a Star is that Arch of the Ecliptick which is contained between the first point of Aries, and the Section of the Ecliptick, with a great Circle drawn from the Pole of the Ecliptick through the center of the Star, being re-

coned according to the ſucceſſion of the ſigns.

Which to find.

Lay one end of the Quadrant of Altitude upon the Pole of the Ecliptick, and the graduated edge thereof, upon the Center of the Star, and ſo it ſhall ſhew in the Ecliptick, the ſign and degree of Longitude.

Of the Latitude as it is taken on the Celeſtial Globe.

5. It is accounted in a great Circle diſtant from the Ecliptick toward either Pole thereof, therefore the Sun, or any Star being in the Ecliptick, hath no Latitude, but the Moon ☾, or any other Planet being not in the Dragons Head ☊, or Dragons Tail ☋, or other Stars being not in the Ecliptick, are ſaid to have Latitude ſo many degrees as they are diſtant from the Ecliptick toward either Pole thereof.

Which to find.

Lay one end of the Quadrant of Altitude upon the Pole of the Ecliptick, and the graduated edge thereof upon the Center of the Star, then may you ſee how many degrees thereof are contained between the Star and the Ecliptick, and that is the Latitude thereof.

But if you want the Quadrant of Altitude, then take a pair of Compaſſes, and ſetting one point in the Center of the Star, extend the other till in the neareſt diſtance it touches the Ecliptick,

tick, and the Compaſſes ſo opened and applied to the Equinoctial, ſhall ſhew how many degrees that Latitude is.

Here Note.

That the Declination and right Aſcention of the Sun and Stars have reſpect to the Equinoctial, but their Longitudes and Latitudes have reſpect to the Ecliptick.

To rectify the Globe according to the Latitude of your place.

6. Elevate the proper Pole ſo far above the Horizon as the Latitude of the place propoſed, by moving the Pole of the Globe ſo high by the help of the degrees of the Meridian.

But to rectify for the Suns place is.

7. After the former rectification, to bring the Suns place in the Ecliptick, to the Meridian, turning up the Index of the hour wheel to 12 at noon.

And to rectify for the Zenith is.

8. After the firſt rectification, to faſten the Nut or Screw of the Quadrant of Altitude at the Zenith, that is, ſo many degrees from the Equinoctial as the Pole is elevated.

To find the Amplitude of the Sun or any Star that riſeth and ſetteth.

9. The Amplitude is the Horizontal diſtance of riſing or ſetting from the true points of Eaſt and Weſt, which to find, rectify the Globe by

the ſixth Propoſition according to the Latitude, and bring the degree of the Sun in the Ecliptick, or Center of the Star to the Horizon, and therein ſee how many degrees it is from the Eaſt to Weſt.

To find what Stars do not ſet in any Latitude.

10. By the ſixth Prop. rectify according to the Latitude, and turning about the Globe, mark what Stars paſs between the Elevated Pole and the Horizon, for thoſe (if the North Pole be elevated) are contained within the Artick Circle, and cannot ſet; for the Artick Circle as heretofore it hath been taken, is drawn upon the North Pole, through the North point of the Horizon.

To find the time when the Sun or any Star Riſeth or Setteth.

11. By the ſeventh Prop. rectifie for the Suns place, and move the Degree of the Sun or center of the Star to the Eaſt or Weſt part of the Horizon, and then the Index of the Hour Wheel ſhall ſhew the time.

To find how the Conſtellations are ſcituate at any time of the Night.

12. By the Seventh Prop. rectifie for the Suns place: and move about the Globe till the Index come to the Hour deſired, and there hold the Globe to ſhew the preſent ſcituation of the Conſtellations.

To

To find the Oblique aſcention of the Sun or any Star that riſeth or ſetteth.

13. By the ſixth Prop. rectifie for the Latitude, and bring the degrees of the Sun, or center of the Star to the Eaſt part of the Horizon, and obſerve the degree of the Equinoctial which riſeth with it; for the arch of the Equinoctial contained between the firſt point of Aries ♈, and the point of the Equinoctial ſo aſcending is called the oblique aſcention.

To find the Aſcentional difference of the Sun ☉.

14. By the third Prop. find the right aſcention, and again by the thirteenth Prop. find the oblique aſcention thereof, and ſubtract the leſſer of them from the greater, and the remain is the difference of Aſcention: for the difference of Aſcention, is only the difference between the right and oblique Aſcentions: where Note that the difference of Aſcention is an Arch of the Equinoctial, and is always the time of the Suns riſing before 6, and after 6. the time of the Year being conſidered.

Hereby.

15. To get the time of the Suns riſing to a Minute of an hour; turn the Aſcentional-difference into time, allowing 15 *gr.* thereof to every Hour, and to every degree 4 minutes of an Hour; And if the Sun be in the Northern Signes, the Aſcentional-difference is the time

of the Suns riſing before 6 a clock, if in the Southern then after 6 a clock.

Again.

16. Having the time of the Suns riſing, before or after 6 a clock, you may get the length of the Artificial day (that is, the time of the Suns continuance above the Horizon) If the Suns declination be North add it to 6, if South ſubtract it from 6, and ſo ſhall come forth the Semidiurnal Arch, this doubled giveth the length of the artificial day; But if the length of the artificial night be required, then work contrary to that of the day.

To find the time of the day by having the Altitude of the Sun.

17. Firſt by a Quadrant or ſome other Inſtrument find the Altitude of the Sun above the Horizon, and then by the 6, 7, and 8. Prop. rectify the Globe for the Latitude, the Suns place, and the Zenith, and bring the degree of the Ecliptick wherein the Sun is, to agree to the ſame Altitude upon the edge of the Quadrant of Altitude, and then the Index of the Hour wheel ſhall ſhew the time of the day.

To find the Azimuth of the Sun by having his Altitude.

18. The Azimuth of the Sun is the diſtance thereof accounted in the Horizon from Eaſt, Weſt or South; by the 6, 7, and 8. Prop. rectify

fy the Globe, and bring the Suns place in the Ecliptick, to agree to the ſame Altitude on the graduated edge of the Quadrant of Altitude, and then the Quadrant of Altitude ſhall ſhew his Azimuth in the Horizon.

To find the Azimuth of the Sun at any time of the Day.

19. By the 6, and 8. Prop. rectify the Globe, and turn it about till the Index of the Hour wheel, do point to the hour given, then lay the Quadrant of Altitude upon the Suns place in the Ecliptick, and it ſheweth the Azimuth in the Horizon.

At any time of the year, to find the time of Day break, or beginning of Crepuſculus (if any be.)

20. By the 6,7. and 8. Prop. rectify the Globe and Elevate the oppoſite degree of the Sun at the Weſt 18. deg. above the Horizon, and then the Index of the hour wheel ſhall ſhew the time.

Having the Altitude of any known Star, to find the hour of the night.

21. By the 6, 7. and 8 Prop. rectify the Globe and move about the Globe till the Star hath the given Altitude in the graduated edg of the Quadrant of Altitude, and then ſhall the Index of the hour wheel ſhew the hour required.

Having any known Star at the Meridian to find the Hour.

22. By the 6. and 7. Prop. rectify the Globe

and turn the Globe till the ſame Star comes to the brazen Meridian, ſo ſhall the Index of the Hour Wheel ſhew the Hour.

Of the Poëtical Riſing and Setting of Stars.

COSMICAL.

A Star Riſeth Coſmical when it riſeth with the Sun, and Setteth Coſmical, if it ſet when the Sun riſeth.

To find the time of the Year when a Star riſeth Coſmical.

23. By the 6 Prop. rectify, and bring the Star to the Eaſt-part of the Horizon, and obſerve the degree of the Ecliptick, which is at the Eaſt-part of the Horizon with it, and then find the Circle of the Horizon what day of the Month anſwereth to the ſame degree of the Ecliptick.

To find the time of the Year when a Star Setteth Coſmical.

24. By the 6 Prop. rectify and bring the Star to the Weſt part of the Horizon, and Note the degree of the Ecliptick at the Eaſt-part of the Horizon, and find the day of the Month on the Horizon as before.

ACRONICAL.

A Star Riſeth Acronical, when it riſeth in the Eaſt, and the Sun is Setting in the Weſt; And it ſetteth Acronical, when it Setteth with the Sun.

To

To find the time of the Year when a Star Riſeth Acronical.

25. By the ſixth Prop. rectify, and bring the Star to the Eaſt-part of the Horizon, and Note the degree of the Ecliptick cut by the Horizon at the Weſt, and find the day of the Month anſwering thereunto upon the Horizon as before.

To find the time of the Year when a Star Setteth Acronical.

26. By the 6 Prop. rectify, and bring the Star to the Weſt-part of the Horizon, and Note the degree of the Ecliptick cut by the Horizon at the Weſt, and find the day of the Month upon the Horizon as before.

Heliacal.

Heliacal Riſing of a Star, is the riſing of a Star out of the Sun beams, for then it appeareth before the Sun riſing, though before it could not be ſeen by reaſon of its nearneſs to the Sun, being within the Arch of Viſion.

Heliacal Setting is when a Star cometh within the Sun beams, or when a Star is entring into its Arch of Viſion, and then cannot be ſeen ſetting after the Sun by reaſon of its nearneſs to the Sun.

The Arch of Viſion is the Arch of a Vertical Circle contained between the Horizon and the Center of the Sun after it is ſet, or before it riſeth, this altereth according to the ſeveral magnitudes

nitudes of the Stars, for the greater the Star is, the leſs is the Arch of Viſion, and contrary.

The Arches of Viſion belonging to the Stars according to their ſeveral Magnitudes, are theſe.

To the Firſt	12	*To the Planets.*	
Second	13	Venus	5
Third	14	Mercury	10
Fourth	15	Saturn	11
Fifth	16	Jupiter	9
Sixth	17	Mars	12½
Leaſt	18	Moon uncertain.	

To find the time of the year when a Star Riſeth Heliacal.

27. By the 6 Prop. rectify, and bring the Star to the Eaſt-part of the Horizon, and Note the degree of the Ecliptick elevated above the Weſt-part of the Horizon according to the Arch of Viſion appertaining to the ſame Star, and then as before, find the day of the Month on the Limb of the Horizon, anſwering to the oppoſite degree of the Ecliptick ſo elevated at Weſt as aforeſaid.

To find the time of the year when a Star Setteth Heliacal.

28. By the 6 Prop. rectify, and bring the Star to the Weſt-part of the Horizon, and Note the degree of the Ecliptick elevated at the Eaſt-

part

part of the Horizon, according to the Arch of Viſion belonging to the ſame Star, and by the oppoſite of it, find the day of the Month on the Limb of the Horizon as before.

Deſcription of the Terreſtial GLOBE.

IT is a round or ſpherical body, repreſenting the form of the earth and waters.

On this Globe are alſo deſcribed the ten Circles of the *Sphæra armillaris*, *viz.* the *Horizon*, *Meridian*, *Equator*, *Ecliptick*, the two Colures with the four leſſer Circles, *viz.* the two Tropicks, and the two Polar Circles.

Beſides theſe common Circles there are deſcribed upon this Globe divers others Circles paſſing through both Poles of the World, theſe are called Meridians or Circles of Longitude; Alſo certain other Circles parallel to the Equinoctial, called Circles of parallels of Latitude; Alſo certain oblique circular lines paſſing through the center of certain Roſes (ſo called) and theſe are called Rhombs, Courſes, or Points of the Compaſs.

On this Globe are deſcribed the known parts of the World divided into ſeveral quarters, *Europe*, *Aſia*, *Africa*, and *America*, to which is added the unknown land about the South

South Pole called *Magelanica.* And theſe quarters of the World are ſubdivided into ſeveral Kingdoms and Provinces, as may be ſeen in the *Geographers.*

The ZONES.

This Globe is alſo divided into five Zones, one is called the Torrid or burnt Zone, and this lieth between the Tropicks, the inhabitants hereof are call'd *Amphiſcii,* becauſe they have two contrary meridional ſhadows in a Year.

Two are called temperate, and theſe lye between the Tropicks and the Polar Circles; The Inhabitants hereof are called *Hetereſcii,* becauſe they have their Meridional ſhadow one way all the Year.

The two frigid Zones, are comprehended within the Polar Circles; The Inhabitants whereof are called *Periſcii,* becauſe their ſhadow at ſome time of the Year goeth round about them.

The Inhabitants of the Terreſtial Globe, do alſo receive other names relating to their poſitions each to others.

The *Antipodes* are ſuch as dwell diametrically oppoſite each to other, and have all things contrary, as ſeaſons of the Year, and times of the day.

The *Antœſi* are ſuch as dwell ſo far remote from the Equinoctial on one ſide, as the other dwelleth

dwelleth on the other ſide, both under the ſame Meridian.

Theſe have ſome things common, and ſome things proper; the Common, as to have their noon tides together: Proper as that the winter of the one is the others Summer time, and the longeſt day of the one, is the ſhorteſt of the other.

The *Periæſi* are ſuch as live in the ſame parallel of Latitude toward the ſame Pole, and are directly oppoſite each to other, both having the ſame Meridian. Theſe have their Summers, Winters, and increaſe, and ſhortning of days and nights together, but the night of the one is the day of the other.

Parallels of the longeſt day.

Beſides the parallels of Latitude formerly mentioned, there are other Parallels imagined to be drawn upon this Globe, which are called parallels of the longeſt day: The firſt of them is to be drawn at that diſtance from the Equinoctial, where the longeſt day of the Year is 12 Hours and a quarter long: The ſecond, where the longeſt day of the Year is 12 Hours and half long: The third, where the longeſt day of the Year is 13 Hours and quarter long, &c. through places increaſing their longeſt day by a quarter of an Hour, till you come to the parallel where the longeſt day of the Year is 24 Hours long, which is under the

in the Longitude of the ſame place; for the Longitude is but the remotion of a place from the firſt Meridian which paſſeth through the Azores accounting Eaſtwardly.

To find the diſtance between two places.

Put the center of the quadrant of altitude upon one of the places, and the graduated edge upon the other, and the degrees interjacent ſhall ſhew their diſtance in degrees, and theſe may be turned into Miles by multiplying by 60.

To find how one place beareth or lyeth from another.

Elevate the Pole according to the Latitude, of the place where you are, and faſten the quadrant of altitude at the Zenith, then bring the place where you are to the Zenith, and move the graduated edge of the quadrant of altitude to the other place, and then the end of the quadrant of altitude ſhall fall upon the Horizon in the point of bearing.

To find what hour of the day or night it is at any place on the Terreſtial Globe.

Bring the place where you are to the Meridian, and turn the Index of the hour wheel to the hour it is with you at preſent, then turn the other place to the Braſen Meridian, and the Index of the hour wheel will ſhew the hour deſired.

To find by the Terreſtial Globe the quantity of the longeſt day at any place aſſigned.

Elevate the Pole of the Globe according to the

the polar Circles; theſe being drawn each way from the Equinoctial towards each pole, divide the Globe into unequal parts or ſpaces, for though they be equal time, yet they agree not in equal diſtance of place. but are greater or broader near to the Equinoctial, and are narrower the farther they are from it.

CLIMATES.

A Climate containeth two of the parallels of the longeſt day, and altereth the longeſt day by the ſpace of half an hour, beginning at the Equinoctial, and are in all 24, which end under the polar circles; but the Antients for want of knowledge of the parts under the Equinoctial made at firſt but ſeven Climates, and called then by names, but afterwards were added two more, which made up their number to be nine. And theſe of the Antients began to be accounted at 12 and 15 from the Equator.

Propoſitions on the Terreſtial GLOBE.

To find the Latitude of any place ſet thereon.

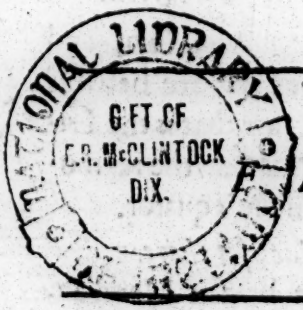
Bring the place to the brazen Meridian, and therein account how many degrees are betwixt the Equinoctial and the place, for that is the Latitude you ſeek; for the Latitude is but the re-motion of the Zenith of a place from the equator.

To find the Longitude of a place ſet thereon.

Bring the place under the brazen Meridian, and then the Meridian ſhall cut the Equinoctial in

the Latitude of the Place given, and bring the Solſtitial point of Cancer (if the North Pole be Elevated) to the Meridian, and turn the Index of the Hour Wheel to 12 at noon, then if you put the Solſtitial point of Cancer to the Weſt-part of the Horizon, the Index on the Hour Wheel ſheweth the time of Sun ſetting there, and that is alſo the Semidiurnal Arch, and being doubled giveth the length of the day, if it exceed not 24 Hours, which end under the Polar Circle.

But if the place aſſigned be within the Polar Circle, then elevate the Pole of the Globe according to the Latitude of the Place, and turn the Globe till ſome point of the Vernal Signes in the Ecliptick touch the North-point of the Horizon and note how many degrees of the Ecliptick are from the Solſtitial point of Cancer, for that number doubled giveth neerly the length of the day in our common dayes, and theſe dayes may be turned into weeks and months, *&c.*



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